

NATIONAL MARINE SANCTUARY  
**System** | CONDITION  
REPORT 2013



June 2013

# *Navigating Change*

*Marine Sanctuary Monitoring  
and  
Condition Reports*



*What is a  
“safe distance”?*





*How do you  
avoid this?*



© Reuters

*Where do you start  
with ocean trash?*





**What do you do when problems  
seem out of control?**




# How do you answer an inquiring public?





# A Focus on Ecosystems and People

A circular inset image showing a large ship on the ocean surface and a colorful coral reef below. The ship is a large, dark-hulled vessel with a white superstructure, moving across a deep blue sea. Below the ship, a vibrant coral reef is visible, featuring various colors of coral and marine life. The text is overlaid on the lower part of the circular inset.

Serve as trustee for the nation's system of marine protected areas to conserve, protect, and enhance the biodiversity, ecological integrity, and cultural legacy of these ecosystems

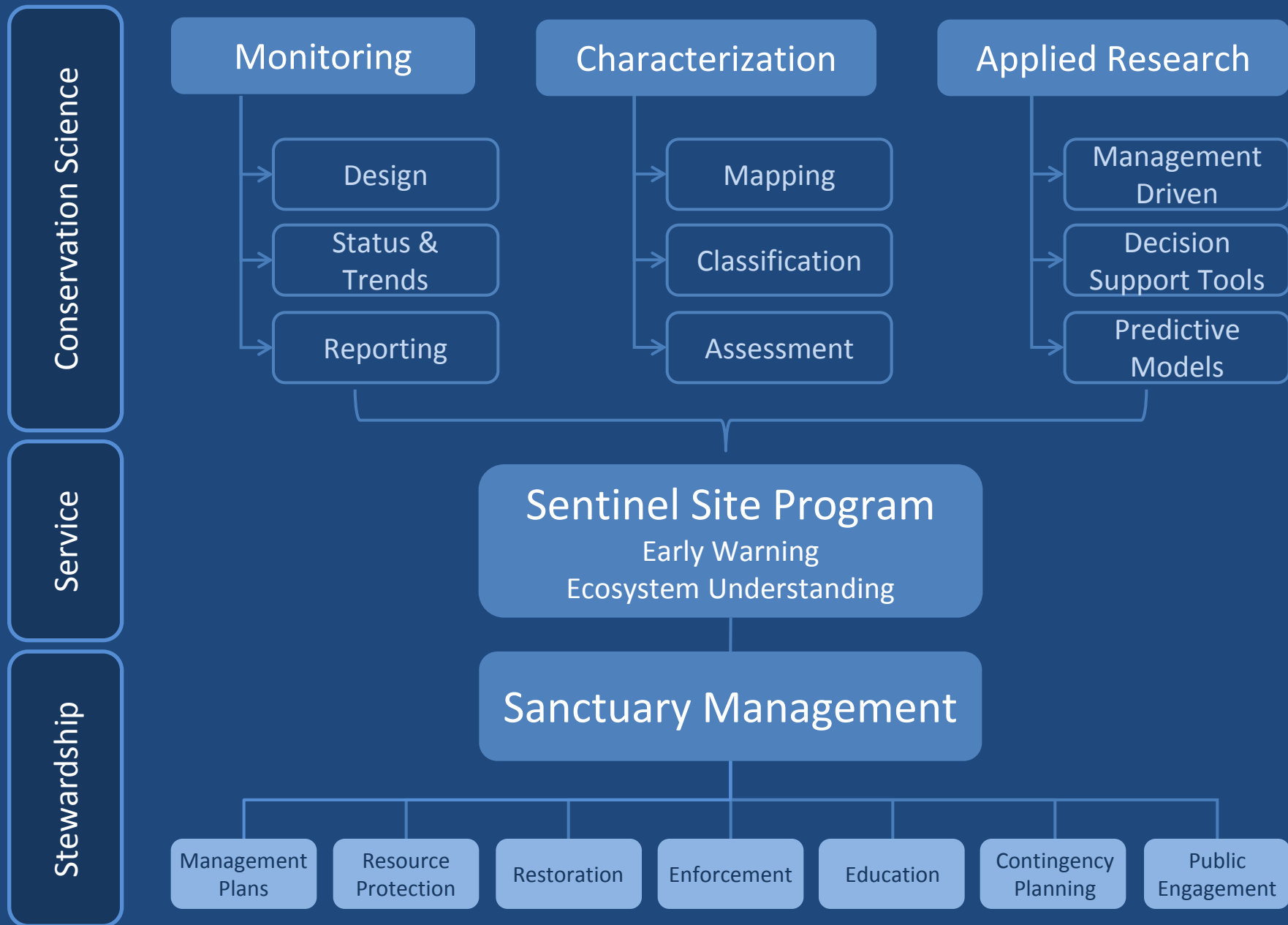
# Ecological Integrity

- Intact natural elements, processes & historic range of variability
- Natural adaptive capacity
- Characteristics persist or regained after disturbance (drivers, biodiversity, relationships)



# Stewardship







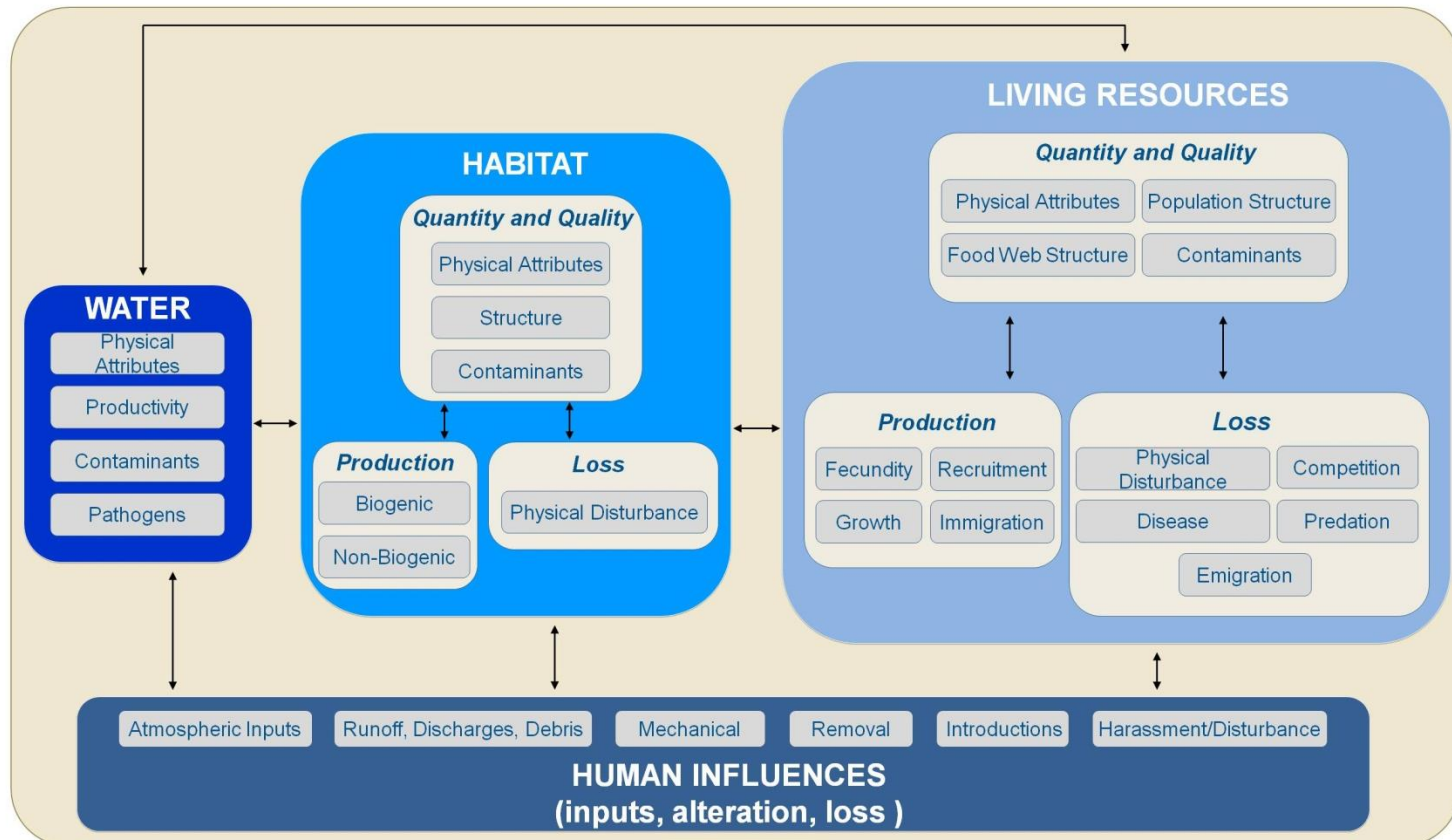
# SWiM = System-Wide Monitoring

“Know where you are, and watch what you’re doing”

- *Consistent* approach to design and reporting
- *Tailored* local monitoring to track resources and human use



# Framework For Assessing Ecosystem Health



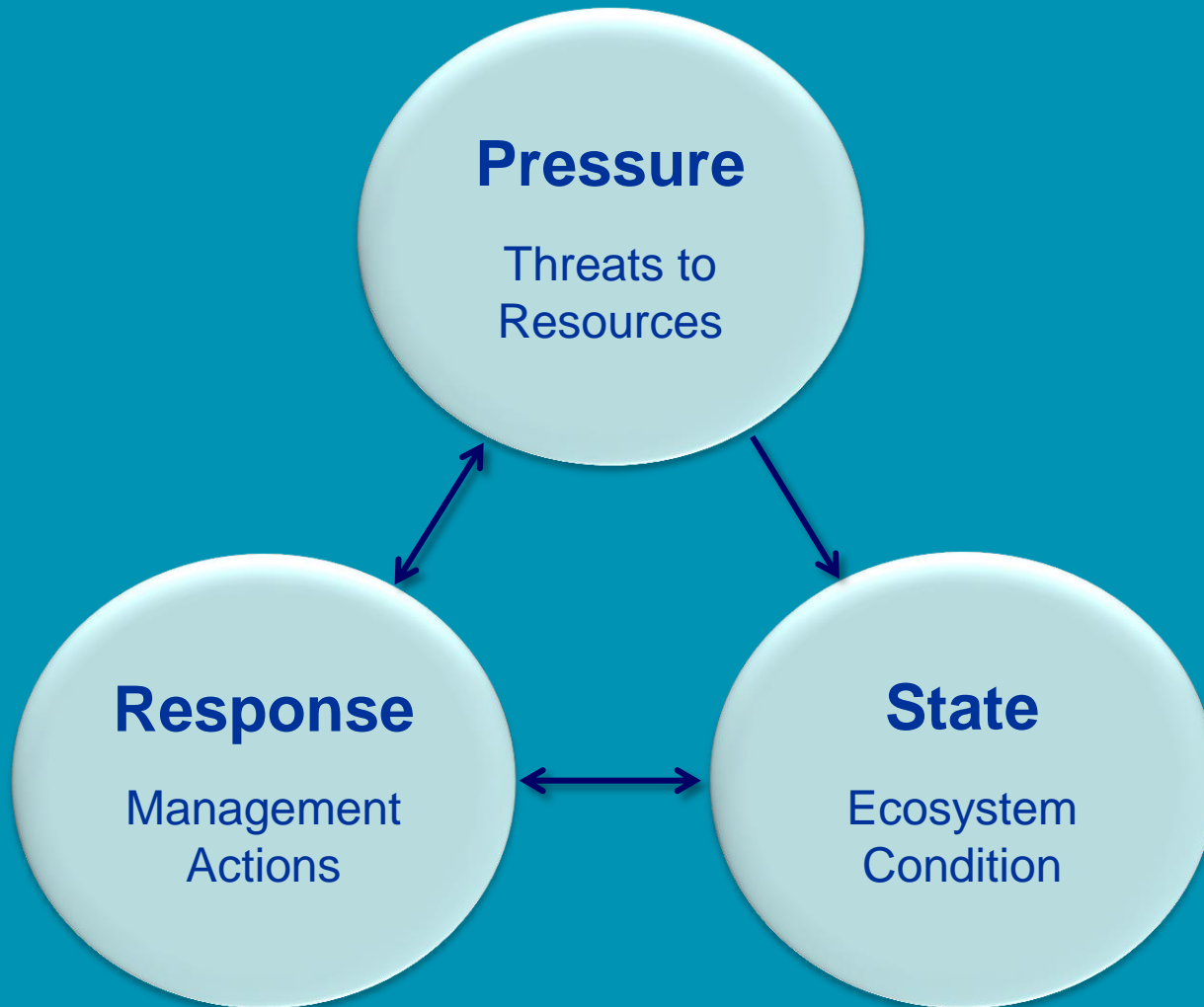
Ecosystem health in marine sanctuaries is communicated through condition reports...

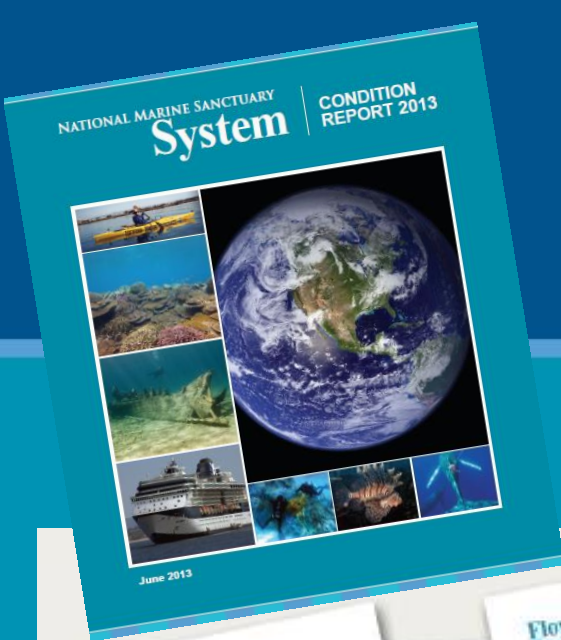
The best indicators of ecosystem health...

- address **Water, Habitat, and Living Resources**
- measure qualities that enable an ecosystem to adapt to change or recover from disturbance



# ***Pressure-State-Response Framework***





# *Condition Reports* *for the National Marine Sanctuaries*



2006-2013



# 17 Questions: Status and Trends

## Water

- Multiple stressors
- Eutrophication
- Human health risks
- Human activities

## Habitat

- Distribution
- Biological structure
- Contaminants
- Human activities

## Living Resources

- Biodiversity
- Fishing impacts
- Non-indigenous species
- Key species status
- Key species health
- Human activities

## Maritime Archaeological Resources

- Integrity
- Environmental hazards
- Human activities

# Condition Report Process

## Expert Workshop

Review  
Condition  
Report  
Questions

Initial Expert  
Rating

Group  
Deliberation

Preliminary  
Rating

## Report Preparation

Sanctuary  
Staff Rating

Draft Report

Expert &  
Peer Review

Condition  
Report

# Standardized Rating Options

## 9. What is the status of biodiversity and how is it changing?

**Good**

Biodiversity appears to reflect pristine or near-pristine conditions and promotes ecosystem integrity (full community development and function).

**Good/Fair**

Selected biodiversity loss has taken place, precluding full community development and function, but it is unlikely to cause substantial or persistent degradation of ecosystem integrity.

**Fair**

Selected biodiversity loss may inhibit full community development and function and may cause measurable but not severe degradation of ecosystem integrity.

**Fair/Poor**

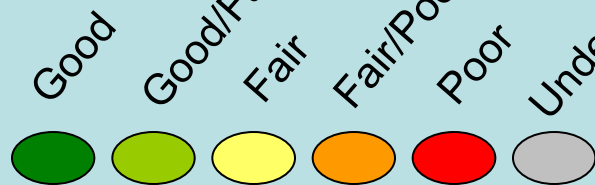
Selected biodiversity loss has caused or is likely to cause severe declines in some but not all ecosystem components and reduce ecosystem integrity.

**Poor**

Selected biodiversity loss has caused or is likely to cause severe declines in ecosystem integrity.



**Status:**



**Trend:**

▲ Improving — Not changing ▼ Declining  
 ? Undetermined N/A Not applicable

## Olympic Coast

National Marine Sanctuary

### CONDITION REPORT 2008



September 2008



Questions/ Resources	Rating	Basis For Judgement	Description Findings	Sanctuary Response
<b>HABITAT</b>				
5. What are the abundance and distribution of major habitat types and how are they changing?	—	Reduction in habitat complexity by bottom-tending gear; short-term impacts from fishing gear and cable installation.	Selected habitat loss or alteration has taken place, precluding full development of living resource assemblages, but it is unlikely to cause substantial or persistent degradation in living resources or water quality.	Sanctuary and partners map and characterize deep habitats and the extent of human impacts and convey information to fisheries managers; large areas have been closed to fishing that uses bottom trawl gear to protect sensitive habitats; negotiated reburial of exposed fiber optic cable; began marine debris removal efforts.
6. What is the condition of biologically structured habitats and how is it changing?	?	Damage by bottom-tending gear in some deep biogenic habitats.	Selected habitat loss or alteration may inhibit the development of living resources, and may cause measurable but not severe declines in living resources or water quality.	
7. What are the contaminant concentrations in sanctuary habitats and how are they changing?	—	Prior studies indicate low levels of contaminants.	Contaminants do not appear to have the potential to negatively affect living resources or water quality.	
8. What are the levels of human activities that may influence habitat quality and how are they changing?	▲	Decrease in bottom trawling and presumably impacts to hard-bottom habitats.	Selected activities have resulted in measurable habitat impacts, but evidence suggests effects are localized, not widespread.	

# System Report

**National Summary**

**Common Concerns**

**Successes & Lessons Learned**

**Our Actions**



# System-Wide Ratings

	Pacific			West Coast								Northeast			Southeast & Gulf			
	PMNM	HI Humpback	Fagatele	Olympic	Cordell	GF Offshore	GF Estuaries	MB Offshore	MB Nearshore	MB Estuaries	Channel Is.	Thunder Bay	Stellwagen	Monitor	Gray's Reef	FL Keys	FL Gardens	
Multiple stressors	▼	—	▼	?	?	—	?	▼	▼	▼	?	?	—	—	—	▼	▼	Water
Eutrophication	—	—	—	—	—	?	?	▼	▼	—	—	—	—	—	?	—	—	
Human health	—	—	?	—	—	—	?	?	?	?	—	—	—	—	—	—	▼	
Human activities	▲	—	▼	—	?	▲	▲	▲	?	?	—	▲	—	—	—	▲	—	
Distribution	▼	▼	?	—	?	▲	—	?	—	▼	?	NA	—	▲	?	—	—	Habitat
Biogenic	▼	NA	—	?	?	?	▼	?	—	▼	—	NA	—	?	?	▼	—	
Contaminants	—	—	—	—	?	▲	?	▼	▼	▼	▲	NA	—	—	—	?	?	
Human activities	—	▼	—	▲	▲	—	—	▲	?	—	▲	NA	▼	—	▲	▼	—	
Biodiversity	—	NA	—	?	▲	—	▼	?	?	?	?	NA	▲	?	—	▼	—	Living
Fishing impacts	▲	NA	—	▲	▲	▲	—	▲	▲	▲	▲	NA	—	NA	▲	?	?	
Invasives	?	—	—	▼	?	—	?	—	▼	—	▼	—	▼	▼	▼	▼	—	
Key spp	?	▲	—	?	▲	?	▼	—	—	▼	—	NA	—	?	▲	—	?	
Key spp health	?	▼	▼	?	—	▲	?	▼	—	?	?	NA	—	?	?	▼	▼	
Human activities	—	▼	?	▲	▲	—	▼	▲	▼	?	▼	—	—	—	▲	—	?	
Integrity	▼	▼	NA	?	?	?	?	?	?	?	▼	▼	▼	—	NA	▼	NA	Arch.
Env't'l hazards	—	?	NA	—	?	▼	—	▼	—	—	▲	—	—	—	NA	—	NA	
Human activities	▲	▼	NA	?	?	?	?	?	?	—	▲	▲	▼	—	—	▼	NA	



# Successes

	<div> <div>↓</div> MNM <div>↓</div> Pacific Humpback <div>↓</div> Fagatele <div>↓</div> Cmpic <div>↓</div> Cordell <div>↓</div> Offshore <div>↓</div> GF Estuaries <div>↓</div> MB Offshore <div>↓</div> MB Nearshore <div>↓</div> MB Estuaries <div>↓</div> Channel Is. <div>↓</div> Thunder Bay <div>↓</div> Sellwagen <div>↓</div> Monitor <div>↓</div> Cay's Reef <div>↓</div> FL Keys <div>↓</div> Gardens </div>																
Multiple stressors	▼	▼	▼	?	?	—	?	▼	▼	▼	?	?	—	—	—	▼	Water
Eutrophication	—	—	—	—	—	?	?	▼	▼	—	—	—	—	—	?	—	Water
Human health	—	—	?	—	—	—	?	?	?	?	—	—	—	—	—	▼	Water
Human activities	▲	—	▼	—	?	▲	▲	▲	?	?	—	▲	—	—	—	▲	Water
Distribution	▼	▼	?	—	?	▲	—	?	—	▼	?	NA	—	▲	?	—	Habitat
Biogenic	▼	NA	—	?	?	?	▼	?	—	▼	—	NA	—	?	?	▼	
Contaminants	—	—	—	—	?	▲	?	▼	▼	▼	▲	NA	—	—	—	?	
Human activities	—	▼	—	▲	▲	—	—	▲	?	—	▲	NA	▼	—	▲	▼	
Biodiversity	—	NA	—	?	▲	—	▼	?	?	?	?	NA	▲	?	—	▼	Living
Fishing impacts	▲	NA	—	▲	▲	▲	—	▲	▲	▲	▲	NA	—	NA	▲	?	
Invasives	?	—	—	▼	?	—	?	—	▼	—	▼	—	▼	▼	▼	▼	
Key spp	?	▲	—	?	▲	?	▼	—	—	▼	—	NA	—	?	▲	—	
Key spp health	?	▼	▼	?	—	▲	?	▼	—	?	?	NA	—	?	?	▼	Arch.
Human activities	—	▼	?	▲	▲	—	▼	▲	▼	?	▼	—	—	—	▲	—	
Integrity	▼	▼	NA	?	?	?	?	?	?	?	▼	▼	▼	—	NA	▼	
Env't'l hazards	—	?	NA	—	?	▼	—	▼	—	—	▲	—	—	—	NA	—	Arch.
Human activities	▲	▼	NA	?	?	?	?	?	?	—	▲	▲	▼	—	—	▼	

# Problems

Nearshore/Estuaries  
Trawling Impacts  
Invasive Species

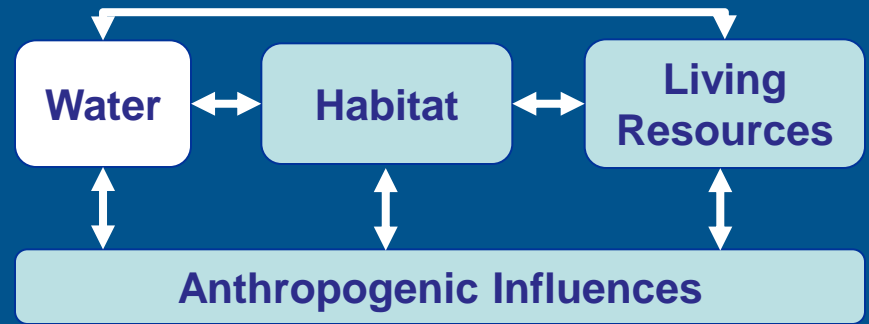
	Pacific			West Coast							Northeast			Southeast & Gulf				
	PMNM	HI Humpback	Fagatele	Olympic	Cordell	GF Offshore	GF Estuaries	MB Offshore	MB Nearshore	MB Estuaries	Channel Is.	Thunder Bay	Stellwagen	Monitor	Gray's Reef	FL Keys	FL Gardens	
Multiple stressors	▼	—	▼	?	?	—	?	▼	▼	▼	?	?	—	—	—	▼	▼	Water
Eutrophication	—	—	—	—	—	?	?	▼	▼	—	—	—	—	—	?	—	—	
Human health	—	—	?	—	—	—	?	?	?	?	—	—	—	—	—	—	▼	
Human activities	▲	—	▼	—	?	▲	▲	▲	?	?	—	▲	—	—	—	▲	—	
Distribution	▼	▼	?	—	?	▲	—	?	—	▼	?	NA	—	▲	?	—	—	Habitat
Biogenic	▼	NA	—	?	?	?	▼	?	—	▼	—	NA	—	?	?	▼	—	
Contaminants	—	—	—	—	?	▲	?	▼	▼	▼	▲	NA	—	—	—	?	?	
Human activities	—	▼	—	▲	▲	—	—	▲	?	—	▲	NA	▼	—	▲	▼	—	
Biodiversity	—	NA	—	?	▲	—	▼	?	?	?	?	NA	▲	?	—	▼	—	Living
Fishing impacts	▲	NA	—	▲	▲	▲	—	▲	▲	▲	▲	NA	—	NA	▲	?	?	
Invasives	?	—	—	▼	?	—	?	—	▼	—	▼	—	▼	▼	▼	▼	—	
Key spp	?	▲	—	?	▲	?	▼	—	—	▼	—	NA	—	?	▲	—	?	
Key spp health	?	▼	▼	?	—	▲	?	▼	—	?	?	NA	—	?	?	▼	▼	Arch.
Human activities	—	▼	?	▲	▲	—	▼	▲	▼	?	▼	—	—	—	▲	—	?	
Integrity	▼	▼	NA	?	?	?	?	?	?	?	▼	▼	▼	—	NA	▼	NA	Arch.
Env't'l hazards	—	?	NA	—	?	▼	—	▼	—	—	▲	—	—	—	NA	—	NA	
Human activities	▲	▼	NA	?	?	?	?	?	?	—	▲	▲	▼	—	—	▼	NA	

# Monitoring Gaps

	Pacific					West Coast					Northeast			Southeast & Gulf				
	PMNM	HI Humpback	Fagatele	Olympic	Correll	GF Offshore	GF Estuaries	MB Offshore	MB Nearshore	MB Estuaries	Channel Is.	Thunder Bay	Stellwagen	Monitor	Gray's Reef	FL Keys	FL Gardens	
Multiple stressors	▼	—	▼	?	?	—	?	▼	▼	▼	?	?	—	—	—	▼	▼	Water
Eutrophication	—	—	—	—	—	?	?	▼	▼	—	—	—	—	—	?	—	—	
Human health	—	—	?	—	—	—	?	?	?	?	—	—	—	—	—	—	▼	
Human activities	▲	—	▼	—	?	▲	▲	▲	?	?	—	▲	—	—	—	▲	—	
Distribution	▼	▼	?	—	?	▲	—	?	—	▼	?	NA	—	▲	?	—	—	Habitat
Biogenic	▼	NA	—	?	?	?	▼	?	—	▼	—	NA	—	?	?	▼	—	
Contaminants	—	—	—	—	?	▲	?	▼	▼	▼	▲	NA	—	—	—	?	?	
Human activities	—	▼	—	▲	▲	—	—	▲	?	—	▲	NA	▼	—	▲	▼	—	
Biodiversity	—	NA	—	?	▲	—	▼	?	?	?	?	NA	▲	?	—	▼	—	Living
Fishing impacts	▲	NA	—	▲	▲	▲	—	▲	▲	▲	▲	NA	—	NA	▲	?	?	
Invasives	?	—	—	▼	?	—	?	—	▼	—	▼	—	▼	—	▼	▼	—	
Key spp	?	▲	—	?	▲	?	▼	—	—	—	—	NA	—	?	▲	—	?	
Key spp health	?	▼	▼	?	—	▲	?	▼	—	?	?	NA	—	?	?	▼	▼	
Human activities	—	▼	?	▲	▲	—	▼	▲	▼	?	▼	—	—	—	▲	—	?	
Integrity	▼	▼	NA	?	?	?	?	?	?	?	?	▼	▼	—	NA	▼	NA	Arch.
Env't'l hazards	—	?	NA	—	?	▼	—	▼	—	—	▲	—	—	—	NA	—	NA	
Human activities	▲	▼	NA	?	?	?	?	?	?	—	▲	▲	▼	—	—	▼	NA	

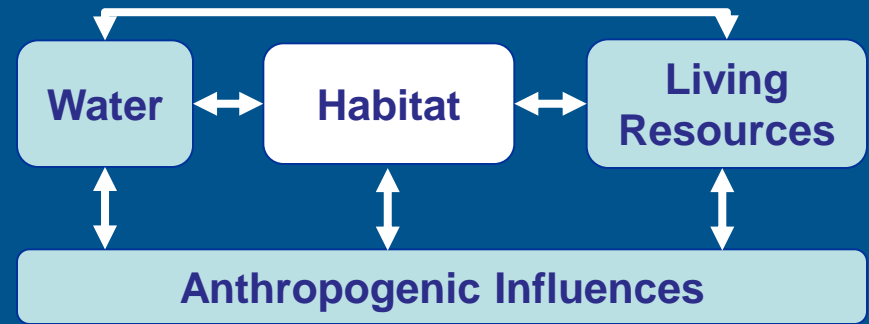


# Water Quality



*Sanctuaries rated water quality condition higher than habitat and living resources. The factor most influencing water quality is proximity to human development.*

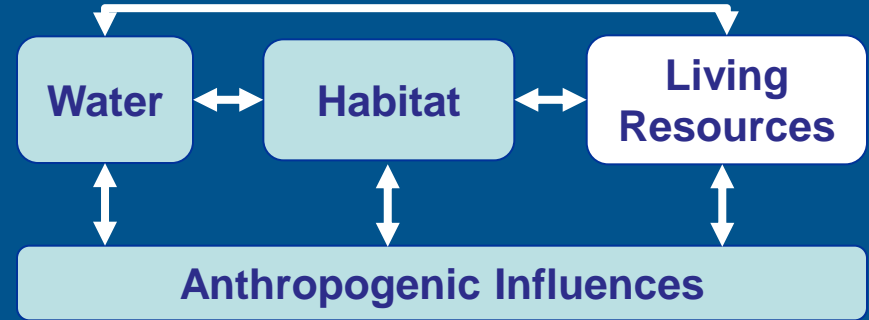
# Habitat Quality



*Human activities pre-dating the establishment of marine sanctuaries continue to pose significant challenges to management.*



# Living Resource Quality



*Challenges to improve living resource quality are significant. Many ecosystem processes operate at scales beyond sanctuary boundaries:*

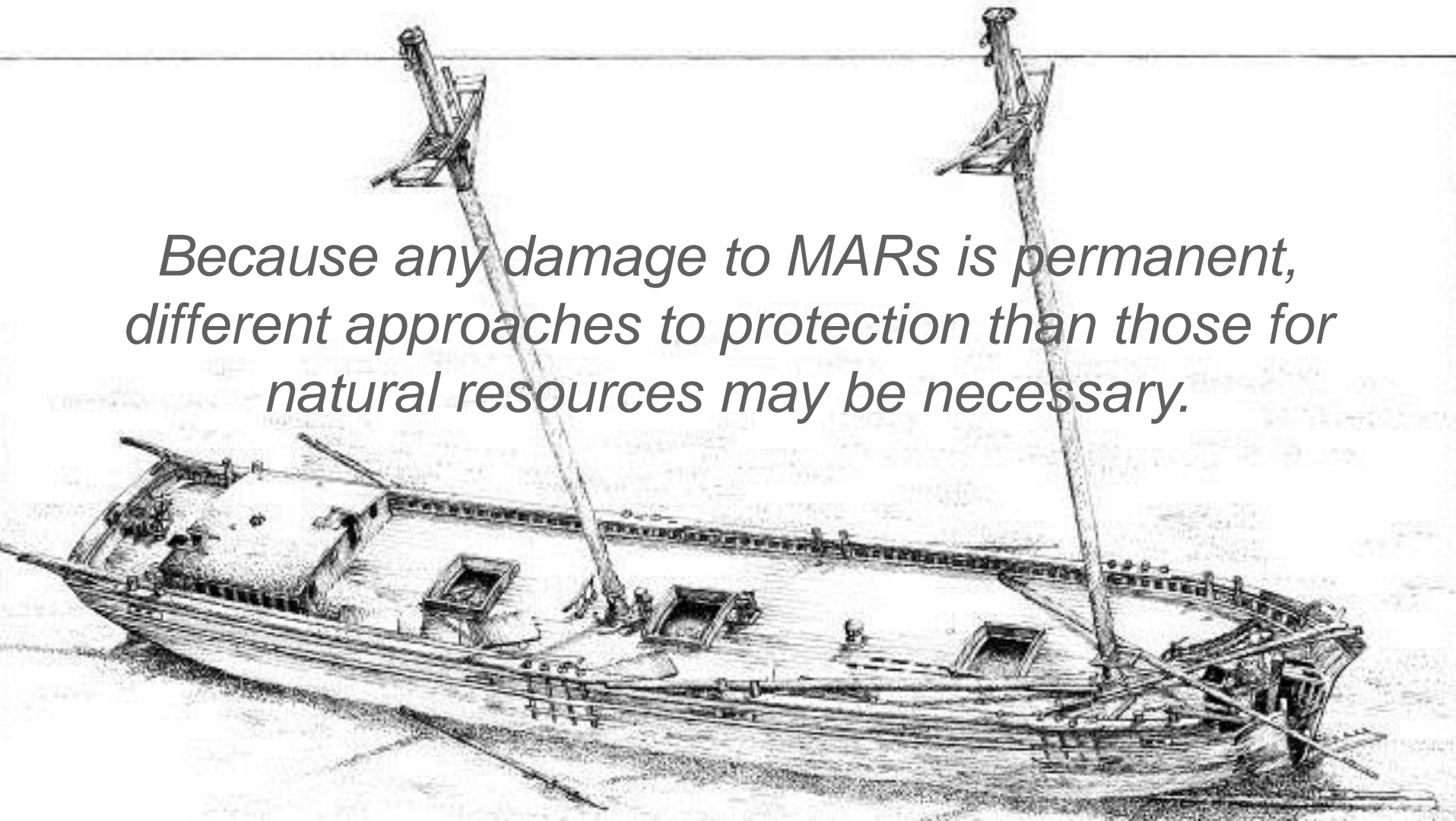


*migratory patterns and movement of key species, regional climate variation, and increasing ocean use.*



# Maritime Archaeological Resource Quality

*Because any damage to MARs is permanent, different approaches to protection than those for natural resources may be necessary.*



# WHAT CONCERNS US?





# WHAT CONCERNS US?



## *Marine Debris*





# WHAT CONCERNS US?



*Changing Abundances  
of Key Species*





# WHAT CONCERNS US?



***Non-Indigenous  
Species***



# WHAT CONCERNS US?



*Fishing Impacts*



# WHAT CONCERNS US?



*Spills*





# WHAT CONCERNS US?



*Tourism and Visitation*



# WHAT CONCERNS US?



*Coastal Development*



# WHAT CONCERNS US?



***Ship Strikes***

# WHAT CONCERNS US?



## *Threats to Archaeological Resources*





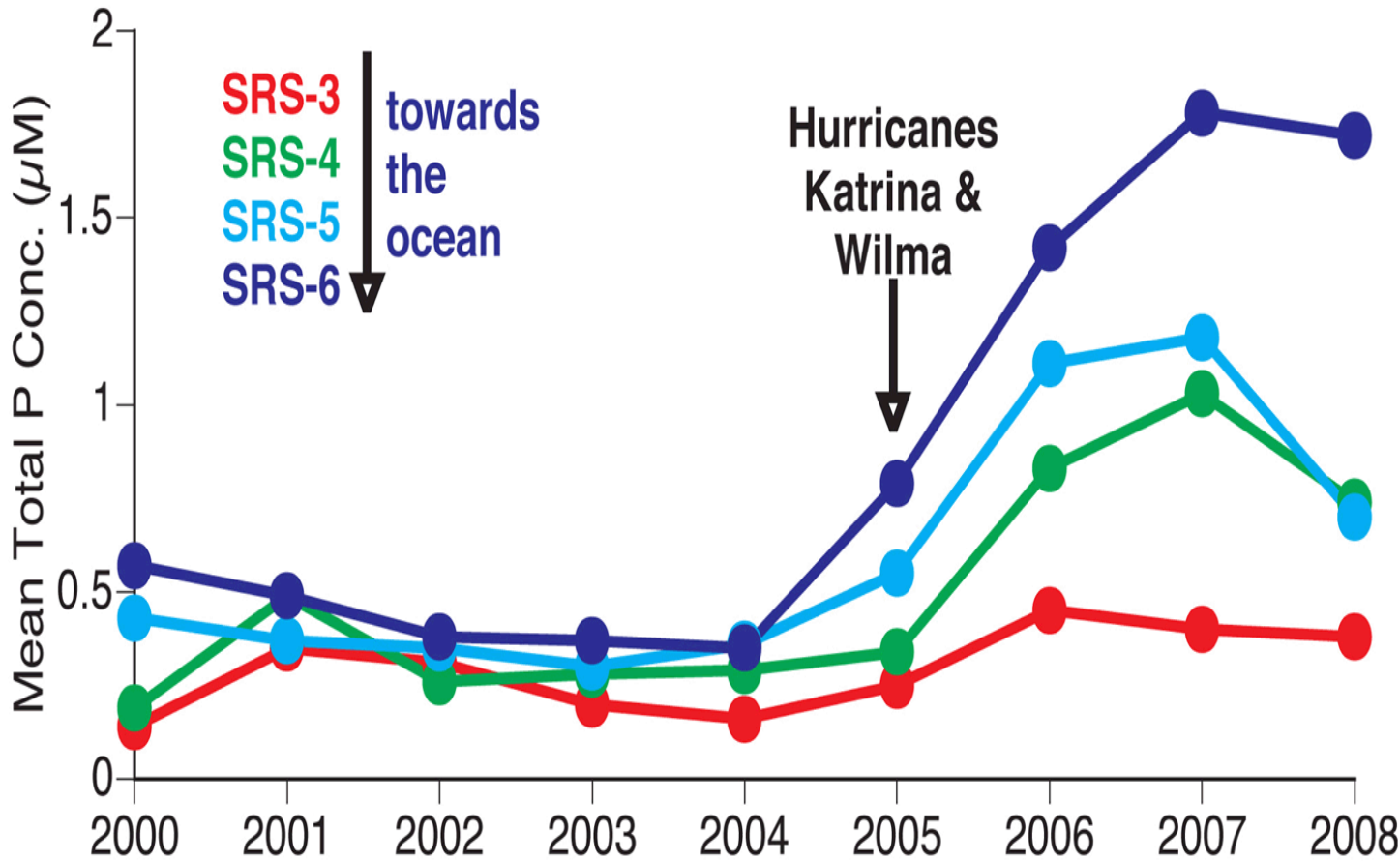
# WHAT CONCERNS US?



*Offshore Industry*

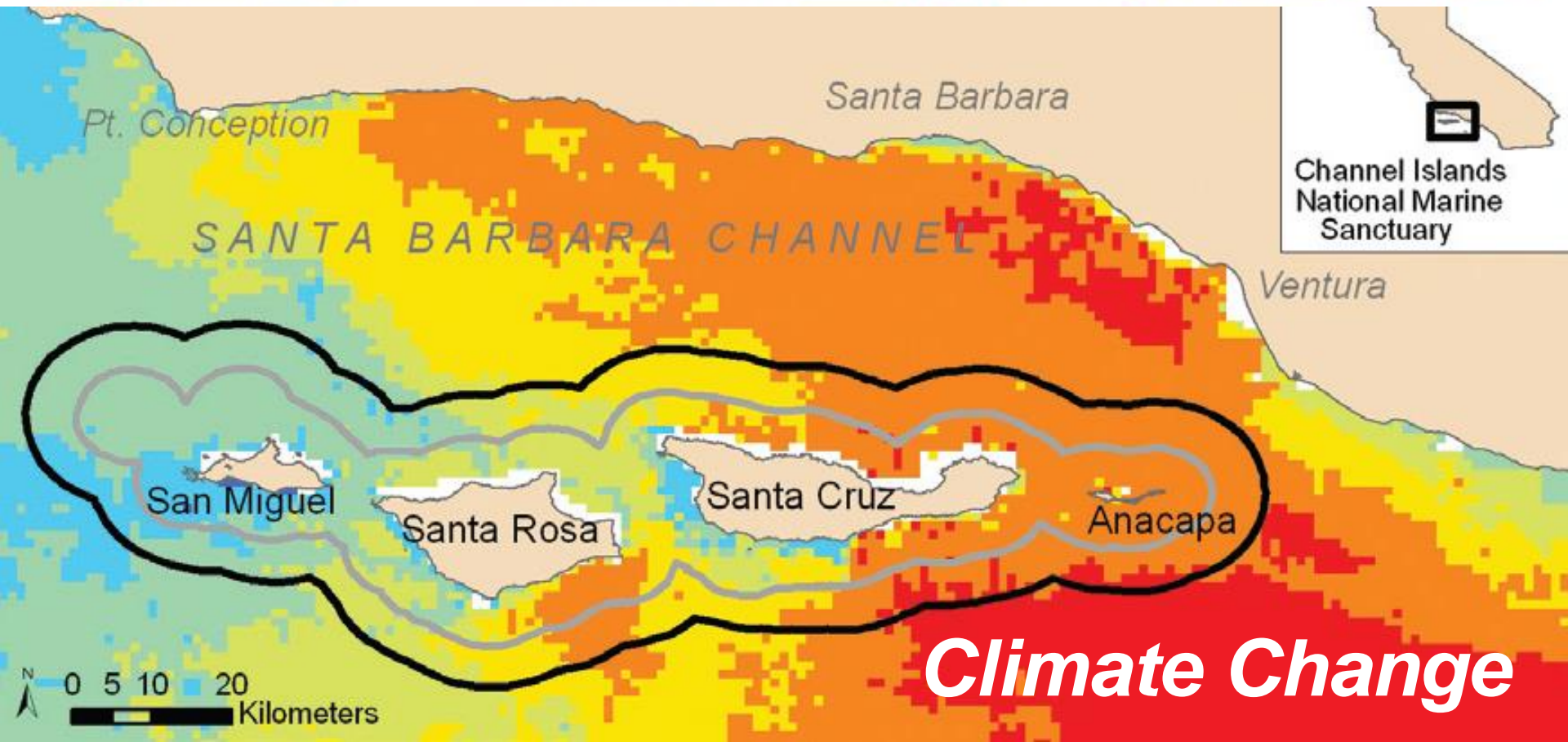


# WHAT CONCERNS US?



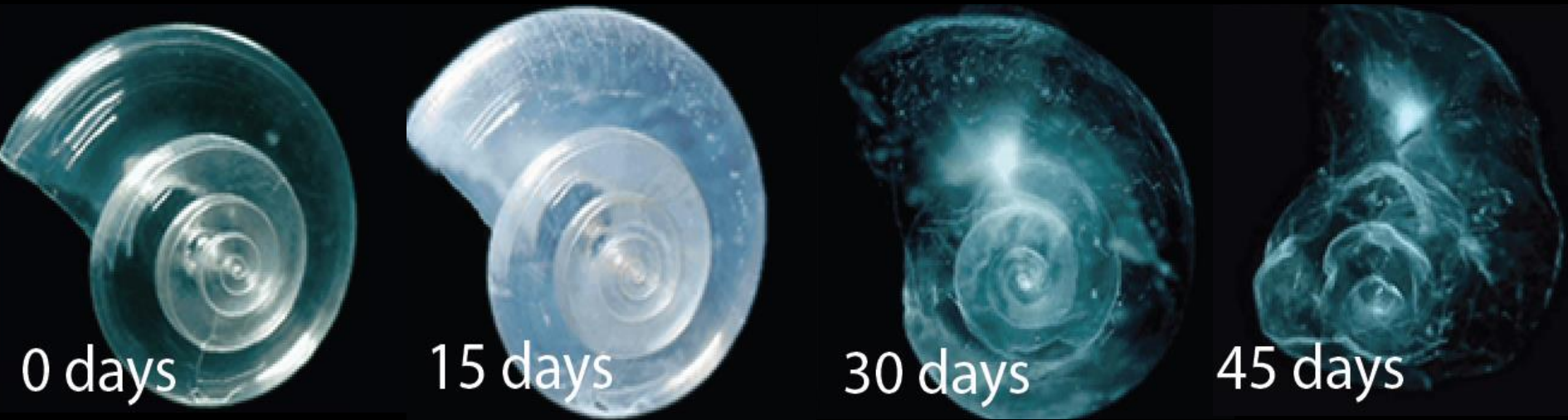
*Degraded  
Water  
Quality*

# WHAT CONCERNS US?





# WHAT CONCERNS US?



***Ocean Acidification***

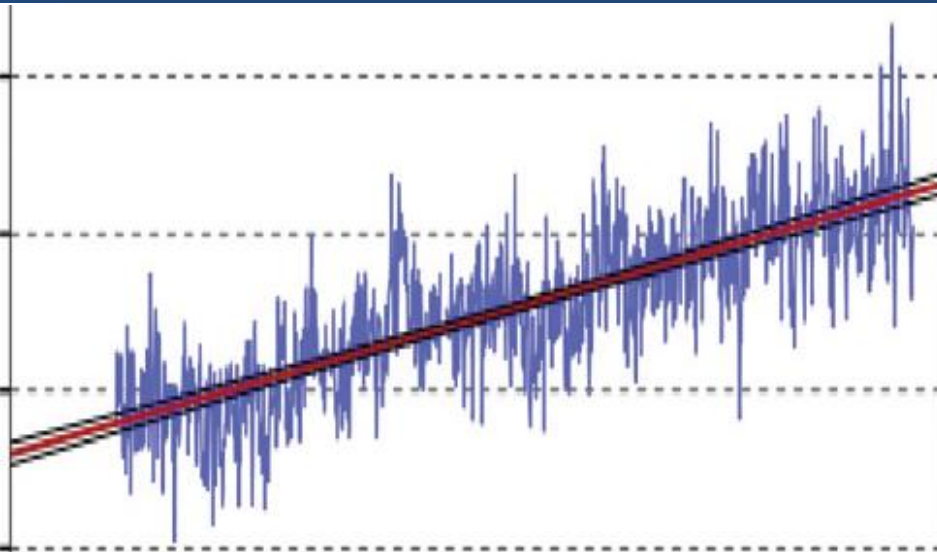


# WHAT CONCERNS US?



Noise

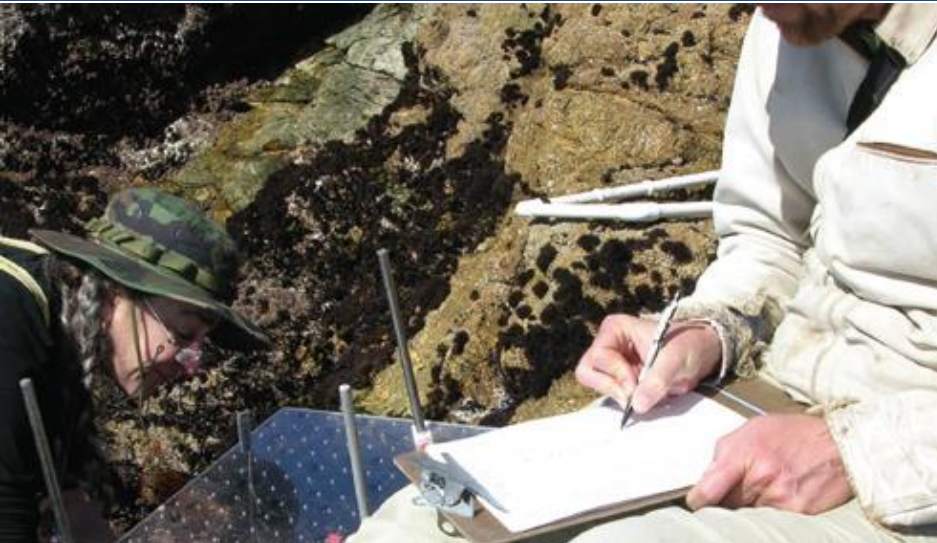
# Successes, Lessons Learned, and Moving Ahead



*Baseline Conditions*



*Beyond the Boundaries*



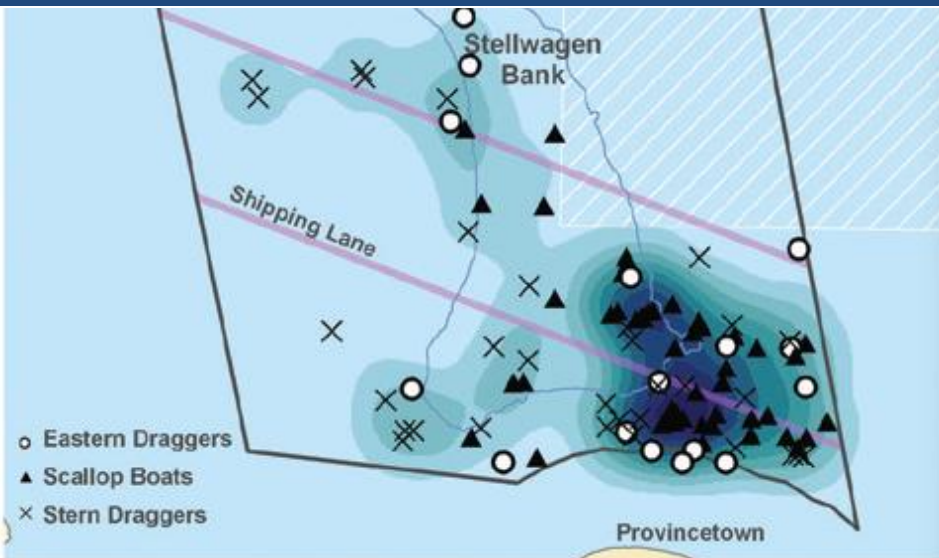
*Monitoring Gaps*



*Collaborations Solve Problems*



# Successes, Lessons Learned, and Moving Ahead



*NMFS Partnerships*



*Marine Reserves*



*Archaeological Resources*



*Value of Isolation*



# *Expert Input, Our Action*

Expert opinion is no substitute for monitoring and research, and vice versa

Science collaborations are essential and desirable

Differentiate commercial and recreational fishing?



# *Process Improvements*

- Update questions
- Expand human systems in condition assessments:  
*DPSER model*
- Information sources and uncertainty
- Management plan links





# Condition Reports Drive Management



National Marine Sanctuaries  
National Oceanic and Atmospheric Administration

